

REMARKS

Claims 1-32 are rejected. Claims 1-32 remain pending.

35 U.S.C. § 102 Rejections

Claims 1-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Mamiya et al. (5,764,322), hereinafter referred to as "Mamiya." The Applicants respectfully submit that the embodiments of the present invention recited in Claims 1, 12, and 23 are not taught or suggested by Mamiya. Claim 1 of the present invention recites,

a backlight device;
a reflective display disposed above said backlight device; and
a light guide within said reflective display operable to conduct light from said backlight device to an area above said reflective display.

Independent Claims 12 and 23 recite similar Claim limitations with the further limitation that the light guides are embedded within the reflective display.

The Applicants respectfully submit that Mamiya teaches away from the present invention in reciting a transmissive liquid crystal display. For example, in column 1, lines 26-27, Mamiya teaches, "a conventional transmissive type liquid crystal display unit..." It is well known in the art that liquid crystal display devices are generally classified into three groups. A transmissive LCD is illuminated, or backlit, from one side and viewed from the other side. Thus, with a transmissive LCD, the characters on the display are illuminated from behind. A reflective display is illuminated by reflecting ambient light from the top of the viewed surface of the display. In other words, with a reflective display, the characters are illuminated

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from the front. The Applicants respectfully submit that the apparatus taught by Mamiya is not operable with the reflective display recited in Claims 1, 12, and 23 of the present invention because the opacity of a reflective display makes backlighting devices ineffective. Thus, the apparatus of Mamiya is ineffective for illuminating the face of a reflective display as claimed in independent Claims 1, 12, and 23 of the present invention.

The Applicants respectfully submit that Figures 1-16 of Mamiya only show directing light through the display in a manner consistent with illuminating a transmissive LCD display. However, Figures 1-16 of Mamiya do not show or suggest reflecting light onto the top or viewed surface of the display in a manner necessary for illuminating the reflective display as recited in Claims 1, 12, and 23. The Applicants further submit that Mamiya does not teach or suggest using a reflective display in the specification or any motivation for using one. In embodiments of the present invention, the light guides direct light to the top of the reflective display. The light is then reflected onto the top surface of the reflective display, thus rendering characters displayed upon it legible. The light guides themselves are not used to illuminate characters displayed upon the reflective display, but to direct light to a reflecting film disposed above the reflective display. The reflecting film then directs light onto the top of the reflective display, thus rendering it legible.

The Applicants respectfully submit that Mamiya teaches away from the embodiments of the present invention because the invention of Mamiya is not operable with a reflective display device. For example, the invention of Mamiya relies upon directing light up through the display device. However, a typical

reflective display is sufficiently opaque as to prevent the transmission of light through the display itself. As a result, the light guiding sheet of Mamiya is inoperable with the reflective display recited in Claims 1, 12, and 23 of the present invention as it would not adequately illuminate the face of a reflective display. Thus, the Applicants respectfully submit that Mamiya teaches away from the present invention as recited in Claims 1, 12, and 23.

Additionally, the Applicants respectfully submit that Mamiya does not teach or suggest the additional claim limitation of a light guide within a reflective display as recited independent Claims 1, 12, and 23 of the present invention. Instead, the light guiding sheet of Mamiya is disposed on the back side of the LCD and directs light through the entire transmissive LCD display rather than specific light conducting devices embedded within the display device. For example, column 6, lines 66-67 and column 7, line 1 of Mamiya state, "the glass substrate of a liquid crystal display panel is positioned on the upper surface of the light guiding body 114." In other words, the light guiding body of Mamiya is disposed underneath the substrate of the liquid crystal device. Similar teachings are found in column 8, lines 34-35; column 10; lines 19-24; and column 11, lines 36-41 of Mamiya. Therefore, for these reasons, the Applicants respectfully submit that the rejection of Claims 1, 12, and 23 of the present invention overcome the cited reference under 35 U.S.C. § 102(b).

The Applicants respectfully submit that Mamiya does not anticipate the embodiments of the present invention recited in Claims 2-3, 5-11, 13-14, 16-22, 24-25, and 27-32 as these Claims are dependent on allowable base Claims and recite

additional limitations. Accordingly, the Applicants respectfully assert that Claims 2-3, 5-11, 13-14, 16-22, 24-25, and 27-32 overcome the cited reference under 35 U.S.C. § 102(b).

With respect to Claims 2 and 13, the rejection cites polarizing plate 116 of Figure 14 of Mamiya as anticipating the reflecting film recited in the Claims. The Applicants respectfully submit that a polarizing plate would not be reasonably interpreted by one skilled in the art as being comparable or interchangeable with a reflecting film. Furthermore, Claims 2 and 13 recite, "a front light reflecting film disposed above said top surface of said reflective display." This is clearly shown as front light reflecting film 440 of Figure 4A. The Applicants respectfully submit that Mamiya clearly shows in Figure 14 that polarizing plate 116 is disposed beneath liquid crystal display panel 100. Accordingly, the Applicants respectfully assert that Claims 2, and 13 overcome the cited reference under 35 U.S.C. § 102(b).

With respect to Claims 3, 5, and 14, the rejection cites column 10, lines 45-46 as anticipating the present invention. The Applicants respectfully submit that Mamiya does not teach or suggest utilizing either an electro-luminescent light device or a cold cathode fluorescent tube within, or embedded within, a reflective display as recited in independent Claims 1 and 12 of the present invention. Therefore, the Applicants respectfully submit that Claims 3 and 5, which depend from Claim 1, are not anticipated by Mamiya. The Applicants respectfully submit that Claim 14, which depends from Claim 12, is also not anticipated by Mamiya. Accordingly, the

Applicants respectfully assert that Claims 3, 5 and 14 overcome the cited reference under 35 U.S.C. § 102(b).

With respect to Claims 6 and 17, the rejection cites column 9, lines 10-39 as anticipating the present invention. Claim 6 of the present invention recites;

a brightness enhancing film (BEF) disposed between said backlight device and said bottom surface of said reflective display and for directing light toward said light guide.

Claim 17 recites similar Claim limitations. The Applicants respectfully submit that Mamiya does not teach or suggest the combination of directing light toward a light guide within, or embedded within, a reflective display as recited in Claims 6 and 17 of the present invention. Accordingly, the Applicants respectfully assert that Claims 6 and 17 overcome the cited reference under 35 U.S.C. § 102(b).

With respect to Claims 7, 8, 18, 19, 29, 30, and 31, the rejection states that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitation. The Applicants respectfully submit that Mamiya does not satisfy the claimed structural limitation of the present invention and, therefore, the recited claim limitations of Claims 7, 8, 18, 19, 29, 30, and 31 are novel. For example, Claims 7 and 8 depend from Claim 1. As discussed above, the Applicants respectfully submit that the apparatus of Mamiya is not capable of sufficiently illuminating a reflexive display as recited in Claim 1. The Applicants further submit that Mamiya does not teach or anticipate a light guide within the reflexive display as recited in Claim 1. Therefore, the Applicants respectfully submit

that Mamiya does not satisfy the claimed structural limitation of the present invention. Accordingly, the Applicants respectfully assert that Claims 7 and 8 overcome the cited reference under 35 U.S.C. § 102(b).

Claims 18 and 19 depend from Claim 12 which recites:

a reflective display disposed above said backlight device and comprising an embedded light guide for conducting light from said backlight device to an area above said reflective display.

The Applicants respectfully submit that Mamiya does not satisfy the claimed structural limitations of Claim 12. Accordingly, the Applicants respectfully assert that Claims 18 and 19 overcome the cited reference under 35 U.S.C. § 102(b).

Claims 29, 30, and 31 depend from Claim 23 which recites:

a reflective display disposed above said backlight device; and a plurality of light guides embedded within said reflective display and enclosing a display area within said reflective display, wherein said light guides conduct light from said backlight device to an area above said reflective display.

The Applicants respectfully submit that Mamiya does not satisfy the claimed structural limitations of Claim 23. Accordingly, the Applicants respectfully assert that Claims 29, 30, and 31 overcome the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 10, the rejection cites column 7, lines 21-25 as anticipating a plurality of light guides which enclose an area of said reflective display. Column 7, lines 21-25 of Mamiya state:

If the refractive index of the light guiding body 104 is smaller than the maximum value of the refractive indexes of the light guiding sheet 1, there is no problem, but it is preferable that the refractive index of the light guiding

body 104 be smaller than the minimum value of the refractive indexes of the stacked films.

The Applicants respectfully submit that the cited portion of Mamiya does not teach or suggest a plurality of light guides enclosing an area of a reflective display as recited in Claim 10 and request further clarification.

With regard to Claim 11, the rejection cites Figure 14, column 7, lines 35-40, and column 10 line 35, as anticipating a plurality of light guides which enclose a sub-pixel of a reflective display. The Applicants respectfully submit that Figure 14 of Mamiya does not show or suggest a sub-pixel area of a reflective display. Column 7, lines 35-40 of Mamiya state:

The light reflected directly by the light guiding sheet 1 has a large number of S-polarized components, and many of the S-polarized components are incident on the glass substrate of the liquid crystal panel by the polarizing plate 116 which allows the S-polarized light to pass through.

The Applicants respectfully submit that this does not teach or suggest a plurality of light guides which enclose a sub-pixel of a reflective display as recited in Claim 11 of the present invention. Column 10, lines 32-36 of Mamiya state:

For the cell-side glass substrate 122, a color filter of three primary colors (red, green, and blue) is formed in correspondence with each pixel electrode, and between the color filters, there is formed a black matrix which is a light shielding layer.

The Applicants respectfully submit that this does not teach or suggest a plurality of light guides which enclose a sub-pixel of a reflective display as recited in Claim 11 of the present invention. Furthermore, a black matrix which is a light shielding layer between color sub-pixels teaches away from a plurality of light guides which enclose

a sub-pixel of a reflective display as recited in Claim 11 of the present invention. Accordingly, the Applicants respectfully assert that Claim 11 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 21, the rejection cites column 1, lines 50-55 as anticipating a plurality of light guides which enclose an area of a reflective display. Column 1, lines 50-55 of Mamiya states:

On the back surface of the light guiding body 104 of FIG. 14 there is a printed dot pattern for diffusely reflecting light that propagates through the light guiding body 104. A reflecting sheet 108 is attached to the entire back surface of the light guiding body 104. A light diffusing plate 110 and one or two prism sheets 112 are provided between the polarizing plate 116 and the light guiding body.

The Applicants respectfully submit that the printed dot pattern taught by Mamiya does not teach or suggest a plurality of light guides which are embedded within and enclose a portion of a reflective display. Accordingly, the Applicants respectfully assert that Claim 21 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 22, the rejection cites Figure 14 and column 7, lines 35-40 as anticipating a plurality of light guides which enclose a sub-pixel of a reflective display. As discussed above with respect to Claim 11, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display, an embedded light guide within the reflective display, or a plurality of light guides enclosing a sub-pixel area as recited in Claim 22. Additionally, the Applicants respectfully submit that Mamiya teaches away from conducting light through light guides enclosing the sub-pixel area in teaching that the sub-pixels are surrounded by a black matrix that is a

light shielding layer. Accordingly, the Applicants respectfully assert that Claim 22 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 23, the rejection cites the rejection of Claims 1 and 11 as anticipating the recited limitations of Claim 23 comprising:

a backlight device;
a reflective display disposed above said backlight device; and
a plurality of light guides embedded within said reflective display and enclosing a display area within said reflective display, wherein said light guides conduct light from said backlight device to an area above said reflective display.

As discussed above with respect to Claim 1, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display disposed above a backlight device, or a plurality of light guides embedded within and enclosing a display area of a reflective display. As discussed above with respect to Claim 11, the Applicants respectfully submit that Mamiya does not teach or suggest a plurality light guides embedded within a reflective display that enclose a sub-pixel area. Furthermore, with respect to Claim 11, the Applicants respectfully submit that Mamiya teaches away from conducting light through the area surrounding the sub-pixel area in teaching that the sub-pixels are surrounded by a black matrix that is a light shielding layer. Accordingly, the Applicants respectfully assert that Claim 23 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 24, the rejection cites the rejection of Claim 2 as anticipating a front light reflecting film disposed above a reflective display and operable to reflect light back onto the reflective display. With respect to Claim 2, the

Applicants respectfully submit that a polarizing plate disposed beneath a transmissive LCD display does not teach or suggest a light reflecting film disposed above a reflective display. Accordingly, the Applicants respectfully assert that Claim 24 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 25, the rejection cites Mamiya and column 3, lines 17-20 of U.S. Patent No. 6,191,833, hereinafter referred to as "Hirakata." The Applicants respectfully submit that neither Mamiya nor Hirakata teach or suggest utilizing a backlight device to illuminate a reflective display as recited in independent Claim 23. Furthermore, neither Mamiya nor Hirakata teach or suggest using an electro-luminescent device as a backlight device for a reflective display. Additionally, the cited portion of Hirakata teaches a backlight device of a side-edge scheme type and does not teach or suggest either a reflective display or a plurality of light guides embedded within the reflective display as recited in Claim 23 of the present invention. Claim 25 depends from Claim 23 and recites additional claim limitations descriptive of the present invention. Accordingly, the Applicants respectfully assert that Claim 25 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 27, the rejection cites the rejection of Claim 23 and column 10, lines 45-46 of Mamiya. However, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display, or a plurality of light guides embedded within the reflective display as recited in Claim 23 of the present invention. Claim 27 depends from Claim 23 and recites additional claim limitations

descriptive of the present invention. Accordingly, the Applicants respectfully assert that Claim 27 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 28, the rejection cites column 9, lines 10-39 of Mamiya as anticipating a brightness enhancing film disposed above a backlight device for directing light toward a plurality of light guides. As discussed above, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display with a plurality of light guides embedded within. Accordingly, the cited portion of Mamiya does not teach or suggest a brightness enhancing film disposed above a backlight device for directing light toward a plurality of light guides as recited in Claim 28 of the present invention. Claim 28 depends from Claim 23 and recites additional claim limitations descriptive of the present invention. Accordingly, the Applicants respectfully assert that Claim 28 overcomes the cited reference under 35 U.S.C. § 102(b).

With respect to Claim 32, the rejection cites Figure 14 and column 7, lines 35-40 as anticipating a plurality of light guides enclosing a sub-pixel area of a reflective display. The Applicants respectfully submit that Mamiya does not teach or suggest a reflective display as recited in Claim 23 of the present invention. Additionally, Mamiya does not teach or suggest a plurality of light guides embedded within a reflective display as recited in Claim 23 of the present invention. Furthermore, with respect to the discussion above with respect to Claim 11, the Applicants respectfully submit that Mamiya does not teach or suggest a plurality of light guides enclosing a sub-pixel area of a reflective display as recited in Claim 32 of the present invention.

Additionally, the Applicants respectfully submit that Mamiya teaches away from conducting light through the area surrounding the sub-pixel area in teaching that the sub-pixels are surrounded by a black matrix that is a light shielding layer. Accordingly, the Applicants respectfully assert that Claim 32 overcomes the cited reference under 35 U.S.C. § 102(b).

35 U.S.C. § 103 Rejections

Claims 4, 15, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Mamiya in further view or Hirakata et al. (U.S. Patent No. 6,191,833) hereinafter referred to as "Hirakata." The Applicants respectfully submit that the recited claim limitations of Claims 4, 15, and 26 are not rendered obvious by Mamiya alone or in combination with Hirakata.

With respect to Claim 4, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display or a light guide within the reflective display as recited in Claim 1 of the present invention. Hirakata does not overcome the shortcomings of Mamiya. Therefore, the Applicants respectfully submit that the combination of a backlight device containing at least one light emitting diode, a reflective display, and a light guide within the reflective display as recited in Claim 4 of the present invention is not rendered obvious by Mamiya alone, or in combination with Hirakata. Accordingly, the Applicants respectfully assert that the rejection of Claim 4 under 35 U.S.C. § 103(a) has been overcome.

With respect to Claim 15, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display with an embedded light guide as recited in Claim 12 of the present invention. Hirakata does not overcome the shortcomings of Mamiya. Therefore, the Applicants respectfully submit that the combination of a backlight device containing at least one light emitting diode, a reflective display with an embedded light guide as recited in Claim 15 of the present invention is not rendered obvious by Mamiya alone, or in combination with Hirakata. Accordingly, the Applicants respectfully assert that the rejection of Claim 15 under 35 U.S.C. § 103(a) has been overcome.

With respect to Claim 26, the Applicants respectfully submit that Mamiya does not teach or suggest a reflective display with an embedded light guide as recited in Claim 12 of the present invention. Hirakata does not overcome the shortcomings of Mamiya. Therefore, the Applicants respectfully submit that the combination of a backlight device containing at least one light emitting diode, a reflective display, and a plurality of light guides embedded within the reflective display as recited in Claim 26 of the present invention is not rendered obvious by Mamiya alone, or in combination with Hirakata. Accordingly, the Applicants respectfully assert that the rejection of Claim 26 under 35 U.S.C. § 103(a) has been overcome.


CONCLUSION

Based on the arguments presented above, the Applicants respectfully assert that Claims 1-32 overcome the rejections of record and, therefore, the Applicants respectfully solicit allowance of these Claims.

The Examiner is invited to contact Applicants' undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

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